**Template for State Healthcare-associated Infection Plan**

In response to the increasing concerns about the public health impact of healthcare-associated infections (HAIs), the US Department of Health and Human Services (HHS) has developed an Action Plan to help prevent healthcare-associated Infections. The HHS Action Plan includes recommendations for surveillance, research, communication, and metrics for measuring progress toward national goals. Three overarching priorities have been identified:

- Progress toward 5-year national prevention targets (e.g., 50-70% reduction in bloodstream infections);
- Improve use and quality of the metrics and supporting systems needed to assess progress towards meeting the targets; and
- Prioritization and broad implementation of current evidence-based prevention recommendations

Background: The 2009 Omnibus bill required states who received Preventive Health and Health Services (PHHS) Block Grant funds to certify that they would submit a plan to reduce HAIs to the Secretary of Health and Human Services not later than January 1, 2010. In order to assist states in responding within the short timeline required by that language and to facilitate coordination with national HAI prevention efforts, the Centers for Disease Control and Prevention (CDC) created a template to assist state planning efforts.

This template helps to ensure progress toward national prevention targets as described in the HHS Action Plan. CDC is leading the implementation of recommendations on national prevention targets and metrics and states should tailor the plan to their state-specific needs.

Initial emphasis for HAI prevention focused on acute care, inpatient settings, and then expanded to outpatient settings. The public health model of population-based healthcare delivery places health departments in a unique and important role in this area, particularly given shifts in healthcare delivery from acute care settings to ambulatory and long term care settings. In non-hospital settings, infection control and oversight have been lacking which have resulted in outbreaks which can have a wide-ranging and substantial impact on affected communities. At the same time, trends toward mandatory reporting of HAIs from hospitals reflect increased demand for accountability from the public.

The State HAI Action Plan template targets the following areas:

1. Enhance HAI Program Infrastructure
2. Surveillance, Detection, Reporting, and Response
3. Prevention
4. Evaluation, Oversight, and Communication

With new Ebola-related, infection control activities, the following two tables have been added to reflect those activities:

5. Infection Control Assessment and Response (Ebola-associated activity from FOA Supplement, CK14-1401PPHFSUPP15, Project A)
6. Targeted Healthcare Infection Prevention Programs (Ebola-associated activity from FOA Supplement, CK14-1401PPHFSUPP15, Project B)

**Framework and Funding for Prevention of HAIs**

CDC's framework for the prevention of HAIs builds on a coordinated effort of federal, state, and partner organizations and is based on a collaborative public health approach that includes surveillance, outbreak response, infection control, research, training, education, and systematic implementation of prevention practices. Legislation in support of HAI prevention provides a unique opportunity to strengthen existing state capacity for prevention efforts.

**Template for developing HAI plan**

The following template provides choices for enhancing state HAI prevention activities in the six areas identified above. For each section, please choose elements which best support current activities or planned activities. Current activities are those in which the state is presently engaged and includes activities that are scheduled to begin using currently available resources. Planned activities represent future directions the state would like to move in to meet currently unmet needs, contingent on available resources and competing priorities. A section for additional activities is included to accommodate plans beyond the principal categories.

**1. Enhance HAI program infrastructure**

Successful HAI prevention requires close integration and collaboration with state and local infection prevention activities and systems. Consistency and compatibility of HAI data collected across facilities will allow for greater success in reaching state and national goals. Please select areas for development or enhancement of state HAI surveillance, prevention, and control efforts.

**Table 1:** State infrastructure planning for HAI surveillance, prevention, and control.

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒ | ☐ | 1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council<br>i. Collaborate with local and regional partners (e.g., state hospital associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians, and networks of acute care hospitals and long term care facilities). | Completed. |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒ | ☐ | ii. NEW: Include hospital preparedness partners (e.g., hospital/healthcare coalitions funded through the ASPR Hospital Preparedness Program). Additional representation from accrediting and/or licensing agency with surveyor authority is ideal.<br>iii. NEW: Engage HAI advisory committee in potential roles and activities to improve antibiotic use in the state (antibiotic stewardship).<br>iv. NEW: Engage HAI advisory committee in activities to increase health department's access to data and subsequently use those data in prevention efforts. | October 2015 |
| ☒ | ☐ | iv. Identify specific HAI prevention targets consistent with HHS priorities. | Completed. |
| | | *Other activities or descriptions:*<br><br>A healthcare-associated infections (HAI) Advisory Panel was mandated by state legislation in 2007. Since 2007, the Advisory Panel has met regularly (3-4 time per year) to advise the Department of State Health Services (DSHS) regarding HAI matters. In 2015, the Advisory Panel is no longer mandated by state legislation; however, the panel will continue to provide guidance on all activities related to the state plan.<br><br>The Advisory Panel remains composed of 18 members, including two members who represent the public as consumers. The Advisory Panel has been focused on the implementation of preventable adverse event (PAE) reporting in recent months. DSHS has also initiated significant collaboration with the Texas Hospital Association (THA), Texas | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | Ambulatory Surgery Center Society (TASCS), Texas Society of Infection Control and Prevention (TSCIP), Texas Medical Association (TMA), TMF Health Quality Institute (TMF), and many other groups to address healthcare-associated infections in Texas. Recently, DSHS collaborated with TMF to target facilities with statistically significant high CAUTI infection rates to enroll in a quality initiative to reduce these infections.<br><br>Expansion of data validation audits for CLABSI is currently under development to assess facility under-reporting of this infection in Texas. Similar protocols will be implemented for other types of infections in the upcoming reporting cycles. | |
| ☒<br><br>☒ | ☐<br><br>☐ | 2. Establish an HAI surveillance prevention and control program<br>i. Designate a State HAI Prevention Coordinator<br><br>ii. Develop dedicated, trained HAI staff with at least one FTE (or contracted equivalent) to oversee HAI activities areas (Integration, Collaboration, and Capacity Building; Reporting, Detection, Response, and Surveillance; Prevention; Evaluation, Oversight, Communication, and Infection Control) | Completed.<br><br>Completed. |
| | | *Other activities or descriptions:*<br>Since 2011, DSHS has designated a State HAI Prevention Coordinator and 8 additional staff members in the Health Care Safety Group. This includes 2 FTEs for conducting data audits, 4 HAI/MDRO/PAE Subject Matter Experts, 1 database manager, and 1 blood borne pathogen/hepatitis specialist. DSHS has resources for 4 additional staff: 3 regional HAI epidemiologists to perform Infection Prevention related consultations and a second database administrator for the Texas Healthcare Safety Network (TxHSN) database. As of August 1st 2015, DSHS has initiated the hiring process for the four new | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | positions. | |
| ☒ | ☐ | 3. Integrate laboratory activities with HAI surveillance, prevention, and control efforts.<br>i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, HL7 messaging of laboratory results) | Ongoing |
| | | *Other activities or descriptions:*<br>The program is working to improve state laboratory capacity. PFGE testing for some multidrug-resistant organisms has been implemented. The laboratory is looking into whole genome sequencing technology for these organisms to aid in outbreak response. | |
| ☒ | ☐ | 4. Improve coordination among government agencies or organizations that share responsibility for assuring or overseeing HAI surveillance, prevention, and control (e.g., State Survey agencies, Communicable Disease Control, state licensing boards) | Ongoing |
| | | *Other activities or descriptions:*<br>DSHS continues to coordinate HAI surveillance activities with other agencies and organizations to promote infection prevention best practices. Other agencies or organizations include the THA, TASCS, Association for Professionals in Infection Control and Epidemiology (APIC), TSCIP, Society for Healthcare Epidemiology of America (SHEA), and the Consumers Union. In addition, DSHS has established collaboration with TMF's HAI reduction quality initiative by helping to identify facilities with high infection rates and who may want to | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | participate in the initiative.<br><br>DSHS has also partnered with the Texas Department of Aging and Disability Services to perform multiple infection prevention related educational presentations throughout the state. These presentations targeted personnel working in long term care facilities and focused on high consequence disease transmission, surveillance and planning, vaccine preventable diseases, and discussed prevention strategies for reducing transmission of Multi-Drug Resistant Organisms (MDROs). | |
| ☒ | ☐ | 5. Facilitate use of standards-based formats (e.g., Clinical Document Architecture, electronic messages) by healthcare facilities for purposes of electronic reporting of HAI data. Providing technical assistance or other incentives for implementations of standards-based reporting can help develop capacity for HAI surveillance and other types of public health surveillance, such as for conditions deemed reportable to state and local health agencies using electronic laboratory reporting (ELR). Facilitating use of standards-based solutions for external reporting also can strengthen relationships between healthcare facilities and regional nodes of healthcare information, such as Regional Health Information Organizations. (RHIOs) and Health Information Exchanges (HIEs). These relationships, in turn, can yield broader benefits for public health by consolidating electronic reporting through regional nodes. | Ongoing |
| | | *Other activities or descriptions:*<br>The Texas HAI program has enhanced public reporting of infections that now includes whether the HAI was a primary contributor to the death of a patient. Reporting has been aligned with NHSN reporting guidelines for specified infections to be reported to the State.<br><br>The National Electronic Disease Surveillance System (NEDSS) or NEDSS-based system has been enhanced to include reporting of Carbapenem-Resistant | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | Enterococcus (CRE) and Multi-Drug Resistant Acinetobacter (MDR-A) in the State. | |

## 2. Surveillance, Detection, Reporting, and Response

Timely and accurate monitoring remains necessary to gauge progress towards HAI elimination. Public health surveillance has been defined as the ongoing, systematic collection, analysis, and interpretation of data essential to the planning, implementation, and evaluation of public health practice, and timely dissemination to those responsible for prevention and control.[1] Increased participation in systems such as the National Healthcare Safety Network (NHSN) has been demonstrated to promote HAI reduction. This, combined with improvements to simplify and enhance data collection, and improve dissemination of results to healthcare providers and the public are essential steps toward increasing HAI prevention capacity.

The HHS Action Plan identifies targets and metrics for five categories of HAIs and identified Ventilator-associated Pneumonia as an HAI under development for metrics and targets (Appendix 1):

- Central Line-associated Blood Stream Infections (CLABSI)
- *Clostridium difficile* Infections (CDI)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections
- Surgical Site Infections (SSI)
- Ventilator-associated Pneumonia (VAP)

State capacity for investigating and responding to outbreaks and emerging infections among patients and healthcare providers is central to HAI prevention. Investigation of outbreaks helps identify preventable causes of infections including issues with the improper use or handling of medical devices; contamination of medical products; and unsafe clinical practices.

[1] Thacker SB, Berkelman RL. Public health surveillance in the United States. Epidemiol Rev 1988;10:164-90.

**Table 2:** State planning for surveillance, detection, reporting, and response for HAIs

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | 1. Improve HAI outbreak detection and investigation | |
| ☒ | ☐ | i. Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments | Ongoing |
| ☒ | ☐ | ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters, or unusual cases of HAIs. | Ongoing |
| ☒ | ☐ | iii. Develop mechanisms to protect facility/provider/patient identity when investigating incidents and potential outbreaks during the initial evaluation phase, where possible, to promote reporting of outbreaks | Completed. |
| ☒ | ☐ | iv. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in Healthcare settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs) | Ongoing |
| | | *Other activities or descriptions:*<br>DSHS continues to evaluate process to improve HAI outbreak detection and investigation based on lessons learned in the field and continuing education from partners such as CSTE, CDC and APIC. Protocols and training sessions are in constant demand by facilities in the state so DSHS is working to respond to the increased demand by requesting additional resources at a regional level.<br><br>Ongoing Protocols and training manuals were developed for health | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | department staff to investigate reported HAIs and MDROs. In addition to standardized and periodic evaluation of HAI events using NHSN, DSHS developed processes and protocols for DSHS staff to evaluate facilities' reported HAI data and identify facilities with statistically significantly high Standardized Infection Ratios (SIRs). These facilities are visited to verify the records and make sure the NHSN criteria are met. When the facility repeatedly has a high SIR for a given HAI, the HAI subject matter experts are consulted and additional site visits are performed, if needed.<br><br>In April 2014, CRE (Klebsiella species and E.coli) and MDR-Acinetobacter (MDR-A) became notifiable conditions in Texas. Protocols and training documents were developed for infection preventionists and health department staff on how to report and investigate these conditions.<br><br>Further training for regional and local health department staff on MDRO outbreak investigations has taken place with conference calls, in person conferences and presentations across the state. | |
| ☒ | ☐ | 2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues. | Ongoing |
| | | *Other activities or descriptions:*<br>Whole genomic sequencing of MDRO to assess outbreak response is under evaluation with the state laboratory. External laboratories are also under consideration to provide this service including capacity for environmental testing. | |
| | | 3. Improve communication of HAI outbreaks and infection control | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒ | ☐ | breaches<br>i. Develop standard reporting criteria including, number, size, and type of HAI outbreak for health departments and CDC | Ongoing |
| ☒ | ☐ | ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards) | Ongoing |
| | | *Other activities or descriptions:*<br><br>Outbreak protocols define the methods and standards for data quality. A standardized form has been developed to characterize the basic parameters of an outbreak e.g. agent, number of cases, geographic location and molecular typing, etc.<br><br>For MDRO reporting in Texas, a standardized investigation form was developed to characterize the basic parameters of a case. The MDRO subject matter experts determine whether a cluster of cases is to be considered an outbreak.<br><br>Facilities requiring consultation or record validation will be contacted by DSHS staff and/ or representatives to schedule site visits or investigations. The local and/ or regional epidemiologists will also be notified whenever there is a site visit scheduled. | |
| ☒ | ☐ | 4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan<br>i. Central Line-associated Bloodstream Infections (CLABSI) | Completed. |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☐<br>☒<br>☐<br><br>☒<br>☐ | ☐<br>☐<br>☐<br><br>☐<br>☐ | ii. *Clostridium difficile* Infections (CDI)<br>iii. Catheter-associated Urinary Tract Infections (CAUTI)<br>iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections<br>v. Surgical Site Infections (SSI)<br>vi. Ventilator-associated Pneumonia (VAP) | |
| | | *Other activities or descriptions:* | |
| ☒<br><br>☒ | ☐<br><br>☐ | 5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).<br>i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1).<br>ii. Establish baseline measurements for prevention targets | Completed.<br><br>Completed. |
| | | *Other activities or descriptions:* | |
| ☒ | ☐ | 6. Develop state surveillance training competencies<br>i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis | Ongoing |
| | | *Other activities or descriptions:*<br><br>The use of NHSN reporting offers the advantage of existing training methods, procedures and technical support. In addition, materials from other NHSN states used for training may serve as templates/models for the development of Texas training materials and resources. As needed, DSHS is prepared to assist facilities/providers with NHSN, other related training and data analysis. Local chapters of APIC and the Texas Society of Infection Control and Prevention will complement state training. | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | | |
| ☒ | ☐ | 7. Develop tailored reports of data analyses for state or region prepared by state personnel | Ongoing |
| | | *Other activities or descriptions:*<br><br>As data are made available, DSHS staff will be able to analyze/interpret HAI information. Chapter 98 (State statute) requires the State to provide risk-adjusted infection rates for healthcare facilities performing selected procedures on a public website. These data will be available by facility and procedure.<br><br>In addition to the facility-specific reports, DSHS staff compiles the aggregate state data on an annual basis and publishes these data in an Annual State Report. This report details HAI data by health service region and includes a regional antibiogram that is then made available to the public and regional health department staff. | |
| ☒ | ☐ | 8. Validate data entered into HAI surveillance (e.g., through healthcare records review, parallel database comparison) to measure accuracy and reliability of HAI data collection | Ongoing |
| ☒ | ☐ | i. Develop a validation plan | Ongoing |
| ☒ | ☐ | ii. Pilot test validation methods in a sample of healthcare facilities | Ongoing |
| ☒ | ☐ | iii. Modify validation plan and methods in accordance with findings from pilot project | Ongoing |
| ☒ | ☐ | iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance | Ongoing |
| ☒ | ☐ | v. Analyze and report validation findings | Ongoing |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒ | ☐ | vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected | Ongoing |
| | | *Other activities or descriptions:*<br>DSHS has developed a data verification protocol to target facilities with statistically significantly high SIRs. Those facilities are audited by DSHS or DSHS representatives (contracted infection preventionists) to determine whether the NHSN definitions were followed correctly.<br><br>Validation findings and difficult case studies are shared with healthcare facilities to improve data collection practices.<br><br>The program is currently re-evaluating the validation process. DSHS is piloting the NHSN CLABSI Validation protocol for the 2015 data to determine resource requirements and other modifications needed to adapt that protocol to Texas. | |
| ☒ | ☐ | 9. Develop preparedness plans for improved response to HAI<br>i. Define processes and tiered response criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks | Completed. |
| | | *Other activities or descriptions:*<br>Protocols (flow diagrams) were developed to determine when DSHS Regulatory/Licensing Staff would be involved due to identified issues with healthcare facilities. The protocol includes several tiers for facility follow-up with the final tier resulting in Regulatory/Licensing involvement. | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | | |
| ☒ | ☐ | 10. Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control practice in non-hospital settings and set standards for continuing education and training | Ongoing |
| | | *Other activities or descriptions:*<br><br>DSHS has established solid linkages with the Texas Department of Aging and Disability Services (DADS), which oversees long term care facilities. Because investigation of provider complaints is an integral part of these agencies' responsibilities, policies and procedures are already in place. New protocols were developed to include maximizing data sharing related to reporting while still protecting confidentiality. Continuing education and training in collaboration with these agencies were developed and provided in 2014-2015. | |
| ☒<br><br><br><br>☒ | ☐<br><br><br><br>☐ | 11. Adopt integration and interoperability standards for HAI information systems and data sources<br>i. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs) across the spectrum of inpatient and outpatient healthcare settings<br>ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation. | Ongoing<br><br><br><br><br><br>Ongoing |
| | | *Other activities or descriptions:*<br><br>HAI reporting is done by facilities through NHSN which standardizes the data both statewide and nationally.<br><br>Pathogen data reported to NHSN by healthcare facilities are reviewed | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | regularly and a list of cases (with PHI removed) that are also in the Texas Notifiable Conditions list is emailed to other program staff to help verify that they were also reported as a notifiable condition. | |
| ☒ | ☐ | 12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data<br>i. Report HAI data to the public | Ongoing |
| | | *Other activities or descriptions:*<br><br>NHSN has been adopted as the required method for all HAI reporting. Its electronic format will reduce the reporting burden by making the process more convenient and accurate.<br><br>Chapter 98, Health and Safety Code requires specific infection information to be reported as risk-adjusted rates. HAI data reports for the consumer are provided on a public website. Additionally, this website will include healthcare quality measures. | |
| ☒ | ☐ | 13. Make available risk-adjusted HAI data that enable state agencies to make comparisons between hospitals. | Completed. |
| | | *Other activities or descriptions:*<br><br>Chapter 98 mandates that the HAI summary data and inter-facility comparisons be risk adjusted. These summary data are published on a website that can be accessed by the public. Users can open multiple | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | facility reports and make comparisons to one another. DSHS also uses the data in these reports to identify facilities that will be audited for record verification. | |
| ☒ | ☐ | 14. Enhance surveillance and detection of HAIs in nonhospital settings | Ongoing |
| | | *Other activities or descriptions:*<br><br>Chapter 98 mandates HAI reporting by ambulatory surgical centers (ASCs). They began reporting surgical site infection data at the same time as general hospitals. In addition, DSHS has established working relationships with other State agencies and healthcare provider organizations outside the hospital setting. Previous collaborative efforts for HAI prevention have been conducted with DADS, Texas Healthcare Association (THCA) and the Texas Association of Homes and Services for the Aging (TAHSA). | |

**3. Prevention**

State implementation of HHS Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendations is a critical step toward the elimination of HAIs. CDC and HICPAC have developed evidence-based HAI prevention guidelines cited in the HHS Action Plan for implementation. These guidelines are translated into practice and implemented by multiple groups in hospital settings for the prevention of HAIs. CDC guidelines have also served as the basis for the Centers for Medicare and Medicaid Services (CMS) Surgical Care Improvement Project. These evidence-based recommendations have also been incorporated into Joint Commission standards for accreditation of U.S. hospitals and have been endorsed by the National Quality Forum. Please select areas for development or enhancement of state HAI prevention efforts.

**Table 3:** State planning for HAI prevention activities

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☐ | ☒ | 1. Implement HICPAC recommendations<br>i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group. | January 2016 |
| | | *Other activities or descriptions:* | |
| ☒ | ☐ | 2. Establish prevention working group under the state HAI advisory council to coordinate state HAI collaboratives<br>i. Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaboratives | Completed. |
| | | *Other activities or descriptions:* | |
| ☒ | ☐ | 3. Establish HAI collaboratives with at least 10 hospitals (this may require a multi-state or regional collaborative in low population density regions)<br>i. Identify staff trained in project coordination, infection control, | Ongoing |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒<br>☒ | ☐<br>☐ | and collaborative coordination<br>ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices<br>iii. Establish and adhere to feedback from standardized outcome data to track progress | Ongoing<br>Ongoing |
| | | *Other activities or descriptions:*<br><br>DSHS plans to continue to develop, identify and implement contracts to conduct additional prevention activities. With other partners such as TMF, the program is working to engage facilities in infection prevention collaboratives over the next few years related to CAUTI, CLABSI and C. Diff. | |
| ☒ | ☐ | 4. Develop state HAI prevention training competencies<br>i. Consider establishing requirements for education and training of healthcare professionals in HAI prevention (e.g., certification requirements, public education campaigns, and targeted provider education) or work with healthcare partners to establish best practices for training and certification | Ongoing |
| | | *Other activities or description*<br>DSHS continually provides targeted education for providers and facility staff focused on infection prevention efforts. Recent trainings have been conducted at state supported living centers and with DSHS regulatory partners. Support of infection prevention staff certification in infection prevention is under consideration. | |
| ☒ | ☐ | 5. Implement strategies for compliance to promote adherence to HICPAC recommendations<br>i. Consider developing statutory or regulatory standards for healthcare infection control and prevention or work with | Ongoing |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | healthcare partners to establish best practices to ensure adherence | |
| ☒ | ☐ | ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs | Ongoing |
| ☒ | ☐ | iii. Improve regulatory oversight of hospitals, enhance surveyor training and tools, and add sources and uses of infection control data | Ongoing |
| ☒ | ☐ | iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered and work with healthcare partners to establish best practices to ensure adherence | Ongoing |
| | | *Other activities or descriptions:*<br><br>The regulatory, statutory and oversight activities to enforce/promote HICPAC guidelines should have a significant impact on HAI prevention and the reduction of infections. Early planning will facilitate an earlier implementation; changes to State rules and regulations traditionally require a considerable amount of time to demonstrate the prevention of disease. | |
| ☒ | ☐ | 6. Enhance prevention infrastructure by increasing joint collaboratives with at least 20 hospitals (i.e. this may require a multi-state or regional collaborative in low population density regions) | Ongoing |
| | | *Other activities or descriptions:*<br><br>DSHS is collaborating with external stakeholders to assess C. Difficile infection prevention possibilities in healthcare facilities including environmental factors. | |

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| | | | |
| ☒ | ☐ | 7. Establish collaborative(s) to prevent HAIs in nonhospital settings (e.g., long term care, dialysis) | Ongoing |
| | | *Other activities or descriptions:*<br>The program is collaborating with other state agencies on infection prevention efforts through training and outbreak response assistance. | |

**4. Evaluation and Communication**

Program evaluation is an essential organizational practice in public health. Continuous evaluation and communication of findings integrates science as a basis for decision-making and action for the prevention of HAIs. Evaluation and communication allows for learning and ongoing improvement. Routine, practical evaluations can inform strategies for the prevention and control of HAIs. Please select areas for development or enhancement of state HAI prevention efforts.

**Table 4:** State HAI communication and evaluation planning

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒<br>☒ | ☐<br>☐ | 1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact<br>i. Establish evaluation activity to measure progress toward targets and<br>ii. Establish systems for refining approaches based on data gathered | <br>Ongoing<br>Ongoing |
| | | *Other activities or descriptions (not required):*<br><br>Summary HAI data are aggregated on an annual basis to identify trends and spatial patterns of HAIs across Texas. These data allow DSHS to identify areas of need, necessary modification(s) and successes—all to refine program operations as needed.<br><br>Needs assessment will target two areas: HAI reporting and prevention projects. Baseline information will be used for selecting and evaluating standardized prevention efforts in facilities. | |
| | | 2. Develop and implement a communication plan about the state's HAI program and about progress to meet public and private stakeholders needs | |

| | | | |
|---|---|---|---|
| ☒ | ☐ | i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public | Ongoing |
| | | *Other activities or descriptions:*<br><br>Ongoing trainings are being conducted and displayed on the public website in addition to facility infection data. The State Annual Reports are published on a public website and links to the report are emailed to all TxHSN contacts/users. Additional education was given to HCF, LTC, administrators, and physicians related to HAIs, IP, and MDRO's. | |
| ☒ | ☐ | 3. Provide consumers access to useful healthcare quality measures<br>i. Disseminate HAI data to the public | Ongoing |
| | | *Other activities or descriptions:*<br><br>Consumer access to quality measures is available on the public website at www.HAITexas.org . Other opportunities to provide awareness of the data to the public are under consideration. | |
| ☒ | ☐ | 4. Guide patient safety initiatives<br>i. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs | Ongoing |
| | | *Other activities or descriptions:*<br><br>The Health Care Safety Advisory Panel continues to be utilized to identify and prioritize patient safety initiatives across the state. | |

**Healthcare Infection Control and Response (Ebola-associated activities)**

The techniques and practice on which infection control protocols are based form the backbone of infectious disease containment for pathogens that are otherwise amplified and accelerated in healthcare settings. Investments in a more robust infection control infrastructure will prevent many HAIs transmitted to, and among, patients and health care workers.

**Table 5: Infection Control Assessment and Response**

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☒<br><br>☒ | ☐<br><br>☐ | 1. Create an inventory of all healthcare settings in state. List must include at least one infection control point of contact at the facility<br><br>2. Identify current regulatory/licensing oversight authorities for each healthcare facility and explore ways to expand oversight | Ongoing |
| | | *Other activities or descriptions:* | |
| ☐<br>☐<br>☐ | ☒<br>☒<br>☒ | 3. Assess readiness of Ebola-designated facilities within the state<br>i. Use CDC readiness assessment tool and determine gaps in infection control<br>ii. Address gaps (mitigate gaps)<br>iii. Conduct follow-up assessments | October 2015 |

| | | | |
|---|---|---|---|
| | | | |
| | | *Other activities or descriptions:* | |
| ☐<br>☐<br>☐ | ☒<br>☒<br>☒ | 4. Assess outbreak reporting and response in healthcare facilities<br>i. Use standard assessment tool and determine gaps in outbreak reporting and response<br>ii. Address gaps (mitigate gaps)<br>iii. Track HAI outbreak response and outcome | January 2016 |
| | | *Other activities or descriptions:* | |

**Table 6: Targeted Healthcare Infection Prevention Programs**

| Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
|---|---|---|---|
| ☐<br>☐<br>☐ | ☒<br>☒<br>☒ | 1. Expand infection control assessments<br>i. Expand assessments to other additional facilities and other healthcare settings and determine gaps in infection control<br>ii. Address gaps (mitigate gaps)<br>iii. Conduct follow-up assessments | October 2016 |
| | | *Other activities or descriptions:* | |
| | | 2. Increase infection control competency and practice in all healthcare | |

| | | | |
|---|---|---|---|
| ☐<br><br><br><br>☒ | ☐<br><br><br><br>☐ | settings through training<br>i. Incorporate general infection control knowledge and practice assessments of competency into state licensing board requirements, credentialing, and continuing education requirements for clinical care providers (e.g., medical license, admitting privileges) and/or licensing/accreditation requirements for healthcare facilities.<br>ii. Develop a sustainable training program based on CDC guidance and technical assistance to perform training, prioritizing on-site train-the-trainer programs in key domains of infection control, including the incorporation of hands on evaluations and competency assessments of best practices and a system to monitor ongoing compliance and competency. | Requires Legislative changes to occur.<br><br><br><br>Ongoing |
| | | *Other activities or descriptions:*<br>In order for DSHS to incorporate general infection prevention knowledge and practice assessments of competency into state licensing board requirements, credentialing, and continuing education requirements for clinical care providers (e.g., medical license, admitting privileges) and/or licensing/accreditation requirements for healthcare facilities, legislative action and support would be required.<br><br>DSHS conducts initial data audits and is involved with outbreak investigations. The program provides technical assistance and hands on evaluation related to infection prevention efforts throughout the state. | |
| ☐<br><br><br>☐ | ☒<br><br><br>☒ | 3. Enhance surveillance capacity to improve situational awareness, describe emerging threats, and target onsite assessments to implement prevention programs<br>i. Build capacity to analyze data reported by facilities in a defined region to allow for a comprehensive assessment of potential healthcare-associated infection threats, and communicate results with healthcare facilities.<br>ii. Work with CDC to guide analytic direction and identify facilities for prioritized assessments/response | Requires Legislative changes to occur. |

| | | | |
|---|---|---|---|
| ☐<br><br><br><br>☐ | ☒<br><br><br><br>☒ | iii. Improve outbreak reporting capacity by developing an infrastructure that includes clear definitions of infectious threats of epidemiologic importance that are communicated to facilities<br>iv. Implement a response plan to address potential emerging threats identified by using enhanced surveillance | |
| | | *Other activities or descriptions:*<br><br>In order for DSHS to enhance surveillance capacity to improve situational awareness, describe emerging threats, and target onsite assessments to implement prevention programs, additional legislative action, staffing resources and funding are required. | |

**Appendix 1**

The HHS Action plan identifies metrics and 5-year national prevention targets. These metrics and prevention targets were developed by representatives from various federal agencies, the Healthcare Infection Control Practices Advisory Committee (HICPAC), professional and scientific organizations, researchers, and other stakeholders. The group of experts was charged with identifying potential targets and metrics for six categories of healthcare-associated infections:

- Central Line-associated Bloodstream Infections (CLABSI)
- Clostridium difficile Infections (CDI)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Methicillin-resistant Staphylococcus aureus (MRSA) Infections
- Surgical Site Infections (SSI)
- Ventilator-associated Pneumonia (VAP)

Following the development of draft metrics as part of the HHS Action Plan in January 2009, HHS solicited comments from stakeholders for review.

**Stakeholder feedback and revisions to the original draft Metrics**

Comments on the initial draft metrics published as part of the HHS Action Plan in January 2009 were reviewed and incorporated into revised metrics. While comments ranged from high level strategic observations to technical measurement details, commenters encouraged established baselines, both at the national and local level, use of standardized definitions and methods, engagement with the National Quality Forum, raised concerns regarding the use of a national targets for payment or accreditation purposes and of the validity of proposed measures, and would like to have both a target rate and a percent reduction for all metrics. Furthermore, commenters emphasized the need for flexibility in the metrics, to accommodate advances in electronic reporting and information technology and for advances in prevention of HAIs, in particular ventilator-associated pneumonia.

To address comments received on the Action Plan Metrics and Targets, proposed metrics have been updated to include source of metric data, baselines, and which agency would coordinate the measure. To respond to the requests for percentage reduction in HAIs in addition to HAI rates, a new type of metric, the standardized infection ratio (SIR), is being proposed. Below is a detailed technical description of the SIR.

Below is a table of the revised metrics described in the HHS Action plan. Please select items or add additional items for state planning efforts.

| Metric Number and Label | Original HAI Elimination Metric | HAI Comparison Metric | Measurement System | National Baseline Established<br><br>(State Baselines Established) | National 5-Year Prevention Target | Coordinator of Measurement System | Is the metric NQF endorsed? |
|---|---|---|---|---|---|---|---|
| 1. CLABSI 1 | CLABSIs per 1000 device days by ICU and other locations | CLABSI SIR | CDC NHSN Device-Associated Module | 2006-2008<br><br>(proposed 2009, in consultation with states) | Reduce the CLABSI SIR by at least 50% from baseline or to zero in ICU and other locations | CDC | Yes* |
| 2. CLIP 1 (formerly CLABSI 4) | Central line bundle compliance | CLIP Adherence percentage | CDC NHSN CLIP in Device-Associated Module | 2009<br><br>(proposed 2009, in consultation with states) | 100% adherence with central line bundle | CDC | Yes† |
| 3a. C diff 1 | Case rate per patient days; administrative/discharge data for ICD-9 CM coded *Clostridium difficile* Infections | Hospitalizations with *C. difficile* per 1000 patient discharges | Hospital discharge data | 2008<br><br>(proposed 2008, in consultation with states) | At least 30% reduction in hospitalizations with *C. difficile* per 1000 patient discharges | AHRQ | No |
| 3b. C diff 2<br><br>(new) | | *C. difficile* SIR | CDC NHSN MDRO/CDAD Module LabID‡ | 2009-2010 | Reduce the facility-wide healthcare facility-onset *C. difficile* LabID event SIR by at least 30% from baseline or to zero | CDC | No |
| 4. CAUTI 2 | # of symptomatic UTI per 1,000 urinary catheter days | CAUTI SIR | CDC NHSN Device-Associated Module | 2009 for ICUs and other locations<br><br>2009 for other hospital units<br><br>(proposed 2009, in consultation with states) | Reduce the CAUTI SIR by at least 25% from baseline or to zero in ICU and other locations | CDC | Yes* |

| Metric Number and Label | Original HAI Elimination Metric | HAI Comparison Metric | Measurement System | National Baseline Established<br><br>(State Baselines Established) | National 5-Year Prevention Target | Coordinator of Measurement System | Is the metric NQF endorsed? |
|---|---|---|---|---|---|---|---|
| 5a. MRSA 1 | Incidence rate (number per 100,000 persons) of invasive MRSA infections | MRSA Incidence rate | CDC EIP/ABCs | 2007-2008<br><br>(for non-EIP states, MRSA metric to be developed in collaboration with EIP states) | At least a 50% reduction in incidence of healthcare-associated invasive MRSA infections | CDC | No |
| 5b. MRSA 2<br><br>(new) | | MRSA bacteremia SIR | CDC NHSN MDRO/CDAD Module LabID‡ | 2009-2010 | Reduce the facility-wide healthcare facility-onset MRSA bacteremia LabID event SIR by at least 25% from baseline or to zero | CDC | No |
| 6. SSI 1 | Deep incision and organ space infection rates using NHSN definitions (SCIP procedures) | SSI SIR | CDC NHSN Procedure-Associated Module | 2006-2008<br><br>(proposed 2009, in consultation with states) | Reduce the admission and readmission SSI§ SIR by at least 25% from baseline or to zero | CDC | Yes¶ |
| 7. SCIP 1 (formerly SSI 2) | Adherence to SCIP/NQF infection process measures | SCIP Adherence percentage | CMS SCIP | To be determined by CMS | At least 95% adherence to process measures to prevent surgical site infections | CMS | Yes |

* NHSN SIR metric is derived from NQF-endorsed metric data

† NHSN does not collect information on daily review of line necessity, which is part of the NQF

‡ LabID, events reported through laboratory detection methods that produce proxy measures for infection surveillance

§ Inclusion of SSI events detected on admission and readmission reduces potential bias introduced by variability in post-discharge surveillance efforts

¶ The NQF-endorsed metric includes deep wound and organ space SSIs only which are included the target.

**Understanding the Relationship between HAI Rate and SIR Comparison Metrics**

The Original HAI Elimination Metrics listed above are very useful for performing evaluations. Several of these metrics are based on the science employed in the NHSN. For example, metric #1 (CLABSI 1) for CLABSI events measures the number of CLABSI events per 1000 device (central line) days by ICU and other locations. While national aggregate CLABSI data are published in the annual NHSN Reports these rates must be stratified by types of locations to be risk-adjusted. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally or even for an individual healthcare facility. For instance, when comparing CLABSI rates, there may be quite a number of different types of locations for which a CLABSI rate could be reported. Given CLABSI rates among 15 different types of locations, one may observe many different combinations of patterns of temporal changes. This raises the need for a way to combine CLABSI rate data across location types.

A standardized infection ratio (SIR) is identical in concept to a standardized mortality ratio and can be used as an indirect standardization method for summarizing HAI experience across any number of stratified groups of data. To illustrate the method for calculating an SIR and understand how it could be used as an HAI comparison metric, the following example data are displayed below:

| **Risk Group Stratifier** | **Observed CLABSI Rates** | | | **NHSN CLABSI Rates for 2008 (Standard Population)** | | |
|---|---|---|---|---|---|---|
| **Location Type** | **#CLABSI** | **#Central line-days** | **CLABSI rate*** | **#CLABSI** | **#Central line-days** | **CLABSI rate*** |
| ICU | 170 | 100,000 | 1.7 | 1200 | 600,000 | 2.0 |
| WARD | 58 | 58,000 | 1.0 | 600 | 400,000 | 1.5 |
| | | | | | | |

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170+58}{100000\times\left(\frac{2}{1000}\right)+58{,}000\times\left(\frac{1.5}{1000}\right)} = \frac{228}{200+87} = \frac{228}{287} = 0.79$$ 95%CI = (0.628,0.989)

*defined as the number of CLABSIs per 1000 central line-days

In the table above, there are two strata to illustrate risk-adjustment by location type for which national data exist from NHSN. The SIR calculation is based on dividing the total number of observed CLABSI events by an "expected" number using the CLABSI rates from the standard population. This "expected" number is calculated by multiplying the national CLABSI rate from the standard population by the observed number of central line-days for each stratum

which can also be understood as a prediction or projection. If the observed data represented a follow-up period such as 2009 one would state that an SIR of 0.79 implies that there was a 21% reduction in CLABSIs overall for the nation, region or facility.

The SIR concept and calculation is completely based on the underlying CLABSI rate data that exist across a potentially large group of strata. Thus, the SIR provides a single metric for performing comparisons rather than attempting to perform multiple comparisons across many strata which makes the task cumbersome. Given the underlying CLABSI rate data, one retains the option to perform comparisons within a particular set of strata where observed rates may differ significantly from the standard populations. These types of more detailed comparisons could be very useful and necessary for identifying areas for more focused prevention efforts.

The National 5-year prevention target for metric #1 could be implemented using the concept of an SIR equal to 0.25 as the goal. That is, an SIR value based on the observed CLABSI rate data at the 5-year mark could be calculated using NHSN CLABSI rate data stratified by location type as the baseline to assess whether the 75% reduction goal was met. There are statistical methods that allow for calculation of confidence intervals, hypothesis testing and graphical presentation using this HAI summary comparison metric called the SIR.

The SIR concept and calculation can be applied equitably to other HAI metrics list above. This is especially true for HAI metrics for which national data are available and reasonably precise using a measurement system such as the NHSN. The SIR calculation methods differ in the risk group stratification only. To better understand metric #6 (SSI 1) see the following example data and SIR calculation:

| **Risk Group Stratifiers** | | **Observed SSI Rates** | | | **NHSN SSI Rates for 2008 (Standard Population)** | | |
|---|---|---|---|---|---|---|---|
| **Procedure Code** | **Risk Index Category** | **#SSI†** | **#procedures** | **SSI rate*** | **#SSI†** | **#procedures** | **SSI rate*** |
| CBGB | 1 | 315 | 12,600 | 2.5 | 2100 | 70,000 | 3.0 |
| CBGB | 2,3 | 210 | 7000 | 3.0 | 1000 | 20,000 | 5.0 |
| HPRO | 1 | 111 | 7400 | 1.5 | 1020 | 60,000 | 1.7 |

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315+210+111}{12600\times\left(\frac{3.0}{100}\right)+7000\times\left(\frac{5.0}{100}\right)+7400\left(\frac{1.7}{100}\right)} = \frac{636}{378+350+125.8} = \frac{636}{853.8} = 0.74$$

95%CI = (0.649,0.851)

† SSI, surgical site infection
* defined as the number of deep incision or organ space SSIs per 100 procedures

This example uses SSI rate data stratified by procedure and risk index category. Nevertheless, an SIR can be calculated using the same calculation process as for CLABSI data except using different risk group stratifiers for these example data. The SIR for this set of observed data is 0.74 which indicates there's a 26% reduction in the number of SSI events based on the baseline NHSN SSI rates as representing the standard population. Once again, these data can reflect the national picture at the 5-year mark and the SIR can serve as metric that summarizes the SSI experience into a single comparison.

There are clear advantages to reporting and comparing a single number for prevention assessment. However, since the SIR calculations are based on standard HAI rates among individual risk groups there is the ability to perform more detailed comparisons within any individual risk group should the need arise. Furthermore, the process for determining the best risk-adjustment for any HAI rate data is flexible and always based on more detailed risk factor analyses that provide ample scientific rigor supporting any SIR calculations. The extent to which any HAI rate data can be risk-adjusted is obviously related to the detail and volume of data that exist in a given measurement system.

In addition to the simplicity of the SIR concept and the advantages listed above, it's important to note another benefit of using an SIR comparison metric for HAI data. If there was need at any level of aggregation (national, regional, facility-wide, etc.) to combine the SIR values across mutually-exclusive data one could do so. The below table demonstrates how the example data from the previous two metric settings could be summarized.

| | **Observed HAIs** | | | **Expected HAIs** | | |
|---|---|---|---|---|---|---|
| **HAI Metric** | **#CLABSI** | **#SSI†** | **#Combined HAI** | **#CLABSI** | **#SSI†** | **#Combined HAI** |
| CLABSI 1 | 228 | | | 287 | | |
| SSI 1 | | 636 | | | 853.8 | |
| Combined HAI | | | 228 + 636 = 864 | | | 287+853.8 = 1140.8 |
| | | | | | | |
| SIR = $\frac{\text{observed}}{\text{expected}} = \frac{228+636}{287+853.8} = \frac{864}{1140.8} = 0.76$ 95%CI = (0.673,0.849) | | | | | | |

† SSI (surgical site infection)